CLAIMS

1. A process for a continuous production of an ε-caprolactone polymer, characterized by comprising: heating an ε-caprolactone polymer under reduced pressure or in an inert gas stream to volatilize unreacted ε-caprolactone from the polymer; and cooling a vapor phase part containing a matter volatilized to thereby recover the unreacted ε-caprolactone, wherein the amount of ε-caprolactone to be recovered is regulated to larger than 5 times by weight relative to the amount of caprolactone dimer.

2. A process for a continuous production of an ε-caprolactone polymer according to Claim 1, wherein the amount of ε-caprolactone to be recovered is regulated to equal to or larger than 10 times by weight relative to the amount of caprolactone dimer.

3. A process for a continuous production of an ε-caprolactone polymer according to Claim 1 or 2, wherein the step of cooling the vapor phase part to recover unreacted ε-caprolactone includes a recovering step in which the temperature is regulated within 20 to 65°C and an optional recovering step in which the temperature is regulated within -2 to 30°C.

4. A process for a continuous production of an ε-caprolactone polymer according to any one of Claims 1 to 3, wherein the ε-caprolactone polymer is a copolymer of a polymer having a hydroxyl group and/or an ester bond and ε-caprolactone.

5. A process for a continuous production of an ε-caprolactone

polymer according to Claim 4, wherein the polymer having a hydroxyl group and/or an ester bond is a polyester.

6. A process for a continuous production of an ε-caprolactone polymer according to any one of Claims 1 to 5, characterized by further comprising a ring-opening polymerization step of ε-caprolactone as a preceding step.

7. A process for a continuous production of an ε-caprolactone polymer, characterized by comprising:

a polymerization step for performing a ring-opening polymerization of ε-caprolactone singly or with other compound;

a monomer-removing step which includes heating an ε-caprolactone polymer under reduced pressure or in an inert gas stream in a treatment apparatus (1) to volatilize a matter to be volatilized containing ε-caprolactone and caprolactone dimer from the polymer; and

a recovering step which includes cooling a vapor phase part containing a matter volatilized in a recovering apparatus (3) to recover ε-caprolactone as a liquid, wherein:

(i) the cooling temperature is regulated;

(ii) the polymerization condition is regulated; and/or

(iii) ε-caprolactone is added to the treatment apparatus (1) and/or the recovering apparatus (3)

so that the amount of ε-caprolactone to be recovered is regulated to larger than 5 times by weight relative to the amount

of caprolactone dimer to prevent clogging in the recovering step.

8. A process for a continuous production of an ε-caprolactone polymer according to Claim 7, wherein the cooling temperature is 20 to 65°C.

9. A process for a continuous production of an ε-caprolactone polymer according to Claim 7 or 8, wherein the heating temperature for the ε-caprolactone polymer in the monomer-removing step is 120 to 300°C.